REMARKS

The Examiner is thanked for the due consideration given the application.

Claims 1 and 4-16 are pending in the application. Claims 2, 3 and 17-19 are canceled by this amendment. Claim 1 has been amended to exclude lead and to set forth that A is methylene. Other claim amendments improve the language and antecedent basis in a non-narrowing fashion.

No new matter is believed to be added to the application by this amendment.

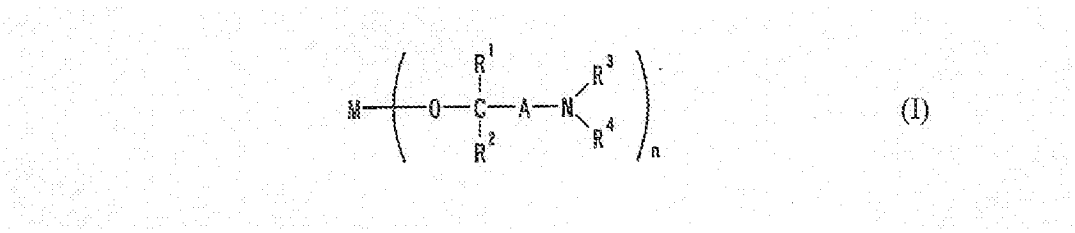
Claim Objections

Claim 10 has been objected to as containing informalities. The comments in the Office Action have been considered, and claim 10 has been appropriately amended.

Rejection Over RHEE et al.

Claims 1, 2, 4-6, 9, 13, 14, 18 and 19 have been rejected under 35 USC §§102(b)/103(a) as being anticipated and/or unpatentable over RHEE et al. (U.S. Patent 6,274,195). This rejection is respectfully traversed.

As is set forth in independent claim 1, the present invention pertains to a metal compound represented by general formula (I):



(I)

where R^1, R^2, R^3, and R^4 each represent an alkyl group having 1 to 4 carbon atoms; A represents a methylene group; M represents a titanium atom or a zirconium atom; and n represents 4.

The present invention is able to attain high volatility and also to suppress unnecessary chemical reactions, which is attributable to the use of the claimed titanium or zirconium compound represented by general formula (I) into which an alkoxide of tertiary alcohols is introduced.

Moreover, even though the claimed titanium compound and zirconium compound have a larger molecular weight than corresponding compounds with an alkoxide of secondary alcohols, the claimed compounds have superior volatility compared to the corresponding compounds (see paragraphs [0053] and [0054] of the present specification).

The difference between the claimed compound of the present invention and the compound of RHEE et al. lies in an alkylene group between an oxygen atom and a nitrogen atom.

An alkylene group present between an oxygen atom and a nitrogen atom of the claimed compound is "$-CR^1R^2-CH_2-$" whereas that of the compound of RHEE et al. is "$-CR_3R_4-CR_3R_4-$" or "$-CH_2-CH_2-$" when m is 2, as apparent from general formula (I) thereof.

As discussed below, the claimed compound exhibits superior volatility as compared to the compound of RHEE et al., which is contributed by the above difference in an alkylene group between an oxygen atom and a nitrogen atom.

Figures 1 and 2 of RHEE et al. (reproduced below) show the volatility of $Ti(dmae)_4$ and $Zr(dmae)_4$, i.e., compounds where an alkylene group between an oxygen atom and a nitrogen atom is "$-CH_2-CH_2-$".

Fig. 1

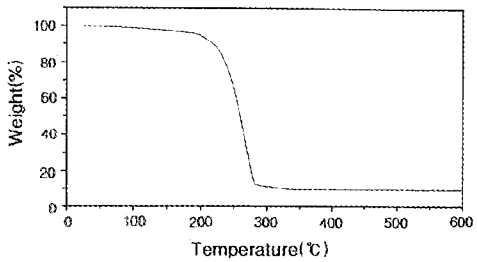
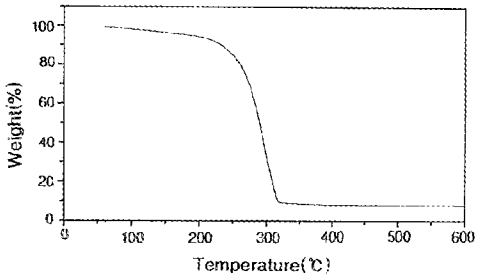


Fig. 2



The volatility of the each compound is as follows.

$Ti(dmae)_4$

50% Mass Loss Temperature: 260°C

Residue at 300°C: more than 5%

$Zr(dmae)_4$

50% Mass Loss Temperature: 290°C

Residue at 300°C: 30%

In contrast, Compound Nos. 13 and 25 in the specification of the present invention, which respectively correspond to $Ti(dmae)_4$ and $Zr(dmae)_4$ of RHEE et al. and have "$-CCH_3CH_3-CH_2-$" as an alkylene group between oxygen and nitrogen atoms, have the following volatility as disclosed in Table 2 of the present specification.

Compound 13

50% Mass Loss Temperature: 239°C

Residue at 300°C: 0.6%

Compound 25

50% Mass Loss Temperature: 242C

Residue at 300°C: 0.8%

Therefore, the compound of the present invention (and its effect) is fundamentally different from the technology of RHEE et al. RHEE et al. thus do not anticipate or render *prima facie* unpatentable a claimed embodiment of the present invention.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

Rejection Over DESU et al. and JONES

Claims 1-19 have been rejected under 35 USC §103(a) as being unpatentable over DESU et al. (U.S. Patent 5,431,958) in view of JONES (WO 03/035926). This rejection is respectfully traversed.

DESU et al. teach with regard to Ti and Zr alkoxides, the relation between molecular weight of R groups and volatility and the relation between branching degree of alkyl groups with the same molecular weight and volatility. However, DESU et al. do not teach the relation between branching degree of R groups that have different molecular weight and volatility. Further, DESU et al. are silent about branching positions, i.e., the reference is silent about whether the structure of alcohols is primary, secondary or tertiary.

JONES indeed teaches a general formula which apparently are comparable to the claimed titanium compound and zirconium compound, but fails to specifically exemplify the titanium compound and zirconium compound of the present invention.

The compound of JONES is either an alkoxide of secondary alcohols or an alkoxide of tertiary alcohols. JONES does not teach that an alkoxide of tertiary alcohols has superior volatility to an alkoxide of secondary alcohols.

A listing of known Ti alkoxides in order of volatility (from high to low) is the following:

$Ti(OiPr)_4$, $Ti(OtBu)_4$, $Ti(OsBu)_4$, $Ti(OEt)_4$, $Ti(OtAm)_4$, $Ti(OnPr)_4$, $Ti(OnBu)_4$ and $Ti(OnAmy)_4$.

With regard to known Ti alkoxides, $Ti(OiPr)_4$, which is an alkoxide of secondary alcohols, has higher volatility than $Ti(OtBu)_4$, which is an alkoxide of tertiary alcohols and has a larger molecular weight than $Ti(OiPr)_4$ by the size of a methyl group composing the tertiary structure.

Moreover, $Ti(OsBu)_4$, which is an alkoxide of secondary alcohols, has higher volatility than $Ti(OtAm)_4$, which is an alkoxide of tertiary alcohols and has a larger molecular weight than $Ti(OsBu)_4$ by a methyl group composing the tertiary structure.

As seen from this, with regard to known Ti alkoxides, alkoxides of secondary alcohols exhibit superior volatility to those of tertiary alcohols. Different from this, in the claimed compounds, an alkoxide of tertiary alcohols exhibits superior volatility to that of secondary alcohols.

As a result, one of ordinary skill and creativity would not produce a claimed embodiment of the present invention from a knowledge of DESU et al. and JONES. A *prima facie* case of unpatentability has thus not been made.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

Conclusion

The Examiner is thanked for considering the Information Disclosure Statements filed June 22, 2006, September 22, 2006 and February 7, 2007 and for making the references therein of record in the application.

Prior art of record but not utilized is believed to be non-pertinent to the instant claims.

The objections and rejections are believed to have been overcome, obviated or rendered moot, and no issues remain. The issuance of a Notice of Allowability is accordingly respectfully submitted.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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